

REMARKS

Applicant intends this response to be a complete response to the Examiner's 10 April 2003 Non-Final Office Action. Applicant has labeled the paragraphs in his response to correspond to the paragraph labeling in the Office Action for the convenience of the Examiner.

Information Disclosure Statement

1. The Examiner contends as follows:

The information disclosure statement filed April 4, 2001 fails to comply with 37 CFR 1.98(a)(2), which requires legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed.

All references cited on this information disclosure statement have been fully considered by the examiner, with the exception of the article entitled "A Study on Evaluation Methods of University Students" by Tanaka, M. No copy of this publication or statement of its relevance, was included with the filing of the statement. Therefore, the examiner has not considered this reference.

Applicant apologizes for any inconvenience he may have caused relating to the quality of the copies of IDS references. Applicant is enclosing a copy of the missing Tanaka reference.

Claim Objections

2. Claims 1, 5, 16-17 and 19-20, stand objected to because of certain informalities. Applicant traverses and request reconsideration based claim amendments, if any, and arguments presented herein.

The Examiner contends as follows:

The word "a" should be 'at' in the limitation "generating a least one related result to the query" in the fifth line of claim 1.

The word "keyword" should be pluralized to "keywords" in the phrase "generating related keyword" in the third line of claim 5.

The word 'consisting' (or other appropriate terminology) should be inserted between "group" and "of" in the phrase "selected from the group of" in the first line of claim 17 to comply with current U.S. practice and the pattern set forth in the previous claims.

The word 'consisting' should also be inserted between "group" and "of" in the same phrase in the first and second lines of claim 20.

Finally, the Office objects to the use of the abbreviation DMR (for Data Mining Routine) in claims 16 and 19 without explicit definition of the abbreviation in the claim language. Thus, DMR must be explicitly defined within the claims, or the abbreviations must be removed entirely.

Appropriate correction is required.

Based on the amendments to the claims, Applicant respectfully requests withdrawal of these objections. Applicant also notes that these claim amendments are of a clerical nature and do not narrow the scope of the claims in which the amendments were made, and, therefore, have no estoppel effect.

Rejections Under 35 U.S.C. §112, ¶1

3. Claims 16 and 19 stand rejected under 35 U.S.C. 12, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant traverses and request reconsideration based claim amendments, if any, and arguments presented herein.

The Examiner contends as follows:

The language of claim 16 implies that "the data mining library" includes each of the data mining routines listed, as well as "mixtures or combinations thereof". One of skill in the art would not be enabled to make such a library from the disclosure of the instant specification because a library, or grouping of objects, cannot contain "mixtures or combinations" of the objects as well of each of the objects individually.

Claim 19 states that "the DM R" (data mining routine by assumption of the examiner) "is a chi squared DMR, a correlation DMR, . . . and mixtures and combinations thereof." One of skill in the art would not be enabled to make a data mining routine that "is" all of the data mining routines listed, as well as mixtures and combinations thereof. The specification provides no disclosure that would enable a person skilled in the art to make or use such a data mining routine.

Applicant intended the term "mixtures and combinations thereof" to mean that the routines can be run back to back or in parallel. However, Applicant understands the Examiner's position and has removed the offending language. Applicant notes that the removal of this language does not narrow the scope of the affected claims as the language clearly now supports running the routines in series or parallel.

Rejections Under 35 U.S.C. §112, ¶2

4. Claims 5-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant traverses and request reconsideration based claim amendments, if any, and arguments presented herein.

The Examiner contends as follows:

Claim 5 uses the language "and/or" in five separate instances (lines 3, 4, 6 [twice] and 7) throughout the claim. This language is indefinite because it is unclear whether all of the listed limitations must be present or only one. The use of the

language "and/or" fails to properly set forth the metes and bounds of the claimed invention.

Claims 6,7, 10-12,. 15 and 18 also use the language "and/or" on multiple occasions within the claim limitations. Therefore, these claims are indefinite under the same reasoning as applied to claim 5.

Claims 6-9 are dependent upon claim 5, and are therefore indefinite for the same reason as claim 5. Claims 11-14 are dependent upon claim 10, and are therefore indefinite for the same reason as claim 10. Claims 16-17 are dependent upon claim 15, and are therefore indefinite for the same reason as claim 15. Finally, claims 19-20 are dependent upon claim 18, and are therefore indefinite for the same reason as claim 18.

In the interest of compact prosecution, the examiner interprets the claims as broadly as reasonably possible such that each use of the language "and/or" is interpreted as "or", the alternative. Thus, only one of the limitations encompassed by any "and/or" must be present.

Referring further to claim 16, it is unclear whether the data mining library must include all of the data mining routines listed, or just one or more (at least one) of them. The claim language is completely indefinite on this matter.

In the interest of compact prosecution, the examiner interprets the claim as broadly as reasonably possible such that at least one of the data mining routines listed must be present in the data mining library, but not necessarily all of them.

Claim 19 recites the limitation "the DMR" in the first line of the claim. There is insufficient antecedent basis for this limitation in the claim. Because the limitation is the entire basis for the remainder of the claim limitation, the claim is rendered completely indefinite.

In the interest of compact prosecution, the examiner assumes that the intended limitation of claim 19 is that the library of data mining routines (from claim 18) includes at least one data mining routine selected from the group consisting of "a chi squared DMR, a correlation DMR . . . [and] a cluster DMR."

Applicant has amended the claims to clarify the meaning of the "and/or" term having removed the offending language and replaced it with or linkages. Applicant thanks the Examiner for viewing the "and/or" term as or. Applicant has also amended the claims to overcome the remaining 112, second paragraph rejections, and, therefore, respectfully request withdrawal of these rejections. Again, the amendments do not narrow the scope of the claims and in fact can be considered as broadening the scope of the claims.

Rejections Under 35 U.S.C. §103

5. **Claims 1-14** are rejected under 35 U.S.C.103(a) as being unpatentable over U.S. Patent No. 6,006,225 to Bowman et al. in view of U.S. Patent No. 5,692,107 to Simoudis et al.

The Examiner contends as follows:

Referring to claim 1, Bowman teaches a system and method for analyzing a query and generating related results as claimed. See Figures 1 & 5-9 and the corresponding portions of Bowman's specification for this disclosure. Refer

specifically to Figures 7-9 and the corresponding portions of the specification for the disclosure of the claimed invention. In particular, Bowman teaches a method for analyzing a query and generating related results comprising:

- determining [Step 710] a keyword ['term in the query'] associated with the query;

- generating [Steps 720 - 770] at least one term ['the top X related terms'] related to at least one keyword;

- supplying the keywords and terms to a search engine [the corresponding modified query is submitted to the search engine' (Column 14, lines 1-12)]; and

- generating at least one related result to the query ['identify a subset of query result items that include this related term' (Column 14, lines 25-45)].

Bowman does not explicitly disclose that the search engine includes "a data mining routine" to which the keywords and related terms are supplied as claimed. However, Bowman does disclose that the "catalog [database(s)] contains millions of items" and "it is important that the site provide an efficient mechanism for assisting users in locating items." (Column 4, lines 65-67) Furthermore, Bowman discloses the importance of discovering trends in the data and its usage. See column 7, line 60 - column 8, line 14 for this disclosure. These two points provide suggestion for using a data mining routine for locating trends and gathering other statistics about the data within the catalog database(s). Bowman also suggests that, "The search refinement methods of the invention may be implemented, for example, as part of . . . a document retrieval system, or any other type of computer system that provides searching capabilities to a community of users." (Column 4, lines 35-43) This provides direct motivation for combining Bowman's search refinement system with any type of search system, including data mining routines

Simoudis discloses a data mining system and method for extracting patterns and relations from data stored in multiple databases to generate predictive models (trends). See Figures disclosure 1-3 and the corresponding portions of Simoudis' specification for this disclosure. Furthermore, Simoudis' data mining engine accepts query terms (keywords or other terms) as input for the data mining (steps 210-214).

It would have been obvious to one of ordinary skill in the art at the time the invention was made [to] incorporate Simoudis' data mining engine (of Fig 1) into Bowman's Web Server (131) or Query Server (132) and to supply the keywords and related terms generated by Bowman's search refinement system to the data mining engine in order to generate trends and gather other statistics, from any type of searchable database(s) such as those of Simoudis (114) or Bowman (133), relating to those keywords and related terms. One would have been motivated to do so because of the suggestions provided by Bowman, as described above.

Referring to claim 2, the system and method of Bowman in view of Simoudis as applied to claim 1 above discloses the invention as claimed. See Figure 7 and the corresponding portion of Bowman's specification for this disclosure. Bowman v. Simoudis teaches the method of claim as above, "wherein the determining step comprises polling [Steps 720-730] a database [Query Correlation Table 137] for terms related to at least one keyword" as claimed.

Referring to claim 3, the system and method of Bowman in view of Simoudis as applied to claim 1 above discloses the invention as claimed. See Figures 8 & 9 and the corresponding portions of Bowman's specification for this disclosure. Bowman

v. Simoudis teaches the method of claim 1, as above "wherein the query [modified query] comprises a plurality of keywords [terms] and a plurality of generated terms [related terms (See column 3, lines 23-25 and column 13; lines 55-57)]" as claimed.

Referring to claim 4, the system and method of Bowman in view of Simoudis as applied to claim 1 above discloses the invention as claimed. See Figures 8 & 9 and the corresponding portions of Bowman's specification forth disclosure. Bowman v. Simoudis teaches the method of claim 3, as above, further comprising: "selecting at least one generated term ['the user clicks on one of these links' (Column 14, line 6)]; and supplying the keywords and the selected terms ['the corresponding modified query is submitted' (Column 14, lines 6-7)] to the data mining routine [See the discussion regarding claim 1 above]" as claimed.

Referring to claim 5, the system and method of Bowman in view of Simoudis as discussed above with regard to claim 1 discloses the invention as claimed. See the discussions regarding claims 1-4 above for the details of this disclosure. Bowman v. Simoudis teaches "a method comprising the steps of:

- constructing a query ['a user submits a query to the web site 130' (Bowman: Column 7, line 14 et seq.)] comprising keywords [terms] and constraints [See Figure 2: prefixes (title, author, subject, etc. - See column 6., lines 59-64) and match types (exact name, start of last name, exact title, etc.)];

- generating (Bowman:F)g. 7] related keywords or related constraints;

- supplying the keywords, the constraints, the related keywords or the related constraints to a data mining routine [See claim 1 above]; and

- obtaining "as is" results [Bowman: 920] or information, related results [Bowman: 920 (See the corresponding portion of the specification and the discussion of claim 1 above)] or information and a question related to the query adapted to enhance query results [Bowman: 910] or information" as claimed.

Referring to claim 6, the system and method of Bowman in view of Simoudis as applied to claim 5 above discloses the invention as claimed. See Figures 8 & 9 and the corresponding portions of Bowman's specification for this disclosure. Bowman v. Simoudis teaches the method of claim 5, as above, "further comprising the steps of:

- selecting the question ['the user clicks on one of these links' Bowman: Column 14, line 6)]; and

- obtaining "as is" results or information, related results of information and a sub-question related to the question adapted to enhance query results of information [query refinement process (iterative . . . user can repeat indefinitely) 'This process could be repeated using additional related terms . . .' (Bowman: Column 14, line 32 et seq.)]" as claimed.

Claims 7 and 8 are rejected on the same basis as claim 6. Bowman's query refinement process is iterative, meaning the process can be repeated as many times as desired to refine the query to the user's satisfaction. See column 14, line 32 et seq. of Bowman's specification for this disclosure. Thus, Bowman's method teaches repeating the steps of selecting a refinement [910] (question or sub-question) and obtaining the related results [920] until the user is satisfied with the results and chooses to stop the refinement process.

Referring to claim 9, the system and method of Bowman in view of Simoudis as applied to claim 5 above discloses the invention as claimed. See Figure 2 and the

corresponding portion of Bowman's specification, and the discussion regarding claim 5 for the details of the details of this disclosure. Bowman's query constraints include containment constraints (exact name, start of last name, exact title, etc.), grouping constraints (prefixes: title, author, subject, etc.), and/or data constraints (particular item genre out of the entire catalog - books in the example provided) as claimed.

Claim 10 is rejected on the same basis as claim 5, in light of the discussion regarding claim 1. See the discussions of claims 1 and 5 above for the details of this disclosure.

Claim 11 is rejected on the same basis as claim 6, in light of the basis for claim 10 above. See the discussion regarding claims 1, 5 and 6 for the details of this disclosure.

Claims 12 and 13 are rejected on the same basis as claims 7 and 8 respectively, in light of the basis for claim 10 above. See the discussions regarding claims 1, 5 and 6-8 for the details of this disclosure.

Claim 14 is rejected on the same basis as claim 9, in light of the basis for claim 10 above. See the discussions regarding claims 1, 5 and 9 for the details of this disclosure.

Applicant does not agree that the combination of Bowman and Simoudis renders amended claims 1-14 obvious.

First Bowman is a search engine. A search engine is designed to allow users to navigate the internet and find URLs that may have information related to a query the user poses to the search engine. However, Bowman does not relate to an analysis of the data contained in the URL, a data mining problem. Bowman differs from typical search engines in that Bowman broadens the search by expanding the posed query keywords by adding related keywords where the related keywords are obtained from a historically based keyword database - Bowman's correlation table. But the terms are still related to finding URLs that relate to the user's query and not to analyzing data in the URLs. Bowman has nothing to do with data mining *per se*.

The Examiner cites Bowman at Col. 7, 1. to Col. 8, 1. for the proposition that Bowman suggests data mining, but that is not to what this cited passage relates. The cited passage relates to how to build better correlation tables – better ways to generate related keywords – for associating query search terms with related search terms. Thus, the "analysis" that occurs in Bowman is to assemble better correlation tables and not to the type of data analysis taught in this invention. Data mining as understood in the context of the present invention is of the type of data mining taught by Simoudis and Vanderveldt et al. But the problem with Bowman is that it does not in anyway relate to or even suggest data mining. Bowman only relates to better ways to search the internet for relevant URLs. Moreover, the present invention utilizes the term expansion process, but directed to data analysis of data in databases. Furthermore, a search engine can actually be used in the present

invention as an interface to the data mining subsystems allowing the user to construct the searches transmitted to the datamining routines and to view results from the datamining routines.

The Examiner also contends that Bowman teaches related queries, but that simply is not the case. Bowman only suggests the related terms for expanding the search query. The present invention uses this same process to broaden the original query. But Bowman in no way discloses, teaches or suggests constructing related queries or questions for subsequent searching of data in a database.

The inventiveness of the present invention is the use of query results to construct questions or associated queries based on the results that may be of interest to the user. Generally, these results are obtained by submitting to the datamining routines both the "as is" query and the enhanced query - query plus added related term and/or constraint. The results from posing the query "as is" and enhanced to a data mining routine that is interfaced with one or more databases through a middleware component is that the results from the datamining process are used to suggest to the user related queries or questions. These related queries or questions are then provided to the user so that the user can, if desired, select one to expand and enhance the discovery process. As the user navigates through the data in one or more databases by selected sub-queries – questions, the process begins to construct a query-by-question pathway through the data. The pathway leads the user to an enhanced pathway of discovery. The present invention cannot only display the sub-question or queries, but it can store the pathway as well as the results found at each step along the path. These stored pathways and results or information are then searchable and allow user's to review other similar pathways and other similar results.

Turning to Simoudis, Simoudis relates to a data mining system includes one top-down data mining routine and a bottom-up data mining routine. However, Simoudis does not teach or suggest a discovery process based on questions constructed from the information retrieved from the data mining process and posing the questions to the user in such a way that the user can then select a posed question to begin a query-by-question path. The selected question is then subjected to the same query pre-processing and data mining as the original query. The new results from the data mining process is then used to generate new questions based on the results which are then posed to the user. This process allows the user to walk down a pathway to new results, new information, new ways of looking at the data or other affects generated by the pathway walk.

Nothing in Bowman or Simoudis discloses, teaches or suggest the process, methods and systems of this invention. Even the combination of Bowman and Simoudis only provides a data

mining process that utilizes queries that have been broadened through the use of related keywords derived from a particular process for generating related keywords, because of the fluidity of the internet, a problem not as prevalent in data mining, where the data structures are much less fluid. Because Bowman in combination with Simoudis does not disclose, teach or suggest a process for mining data down a pathway generated by posing questions derived from the mining results of an originally posed query, Applicant respectfully request withdrawal of these rejections.

6. **Claims 15-20** stand rejected under 35 U.S.C. 103(a) as being unpatentable over Bowman in view of Simoudis as applied of claim 1 above, and further in view of U.S Patent No. 6,266,668 to Vanderveldt et al. Applicant traverses and request reconsideration based claim amendments, if any, and arguments presented herein.

The Examiner contends as follows:

Referring to claim 15; the system and method of Bowman in view of Simoudis as discussed above with regard to claim 1 discloses the invention as claimed. See Figure 1 and the corresponding portion of Bowman's specification, Figure 1 and the corresponding portion of Simoudis' specification, and the combination of these systems as applied in claim 1 above. In particular, the combination of Bowman and Simoudis teaches "a system comprising:

a remote digital processing unit [Bowman: User Computers 110] including an operating system, communication routines, and a user interface having a query construction routine [Bowman: Figure 2] and a results display routine [Bowman: Figure 9];

an application server [Bowman: Web Server 131 and Query Server 132] including an operating system, communication routines; and a query information retrieval content enhancing sub-system [Bowman: Related Term Selection Process 139 & Simoudis: Data Mining Engine of Figure (See claim 1 above)] having a controller [Bowman: 132 & Simoudis: 106], a library of database interfaces [Simoudis: 112], a library of data mining routines [Simoudis: 104 & 104'], a DB middleware component [Simoudis: 105 & 105'] and a query/results database [Bowman 137], where the subsystem generates related results or information and questions related to the query to enhance information retrieval from a query constructed at the remote digital processing unit [See the discussions regarding claims 1-14 above];

a database server [Simoudis: 106] including an operating system, communication routines, a database [Simoudis: 114] and database services [Simoudis: 112]; and

a network [Bowman: 120] interconnecting the remote digital processing unit, the application server and the database server [Bowman: See Figure 1] as claimed.

Neither Bowman nor Simoudis explicitly discloses an operating system and communication routines in each of the computer systems, as claimed. Furthermore, neither reference teaches "a user profiler" as claimed.

Vanderveldt discloses a data mining system and method similar to that of Simoudis. See Figures 1-3 and the corresponding portions of Vanderveldt's

specification for this disclosure. In particular, Vanderveldt teaches the inclusion of operating systems and communications software (routines) in typical computer systems used to "execute the web pages". See column 9, lines 41-53 for this disclosure. Vanderveldt also discloses a user profiler ['neural network trained upon the user profile' (Column 4, lines 64-65)] for extracting information from user profiles to be used in the data mining.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate operating systems and "communications software, such as those of Vanderveldt, into the computer systems of Bowman in view of Simoudis above. One would have been motivated to do so in order to execute the web-based functions of Bowman and Simoudis' methods, as deemed necessary by Vanderveldt's disclosure.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include Vanderveldt's user profiler into the data mining subsystem of Bowman in view of Simoudis. One would have been motivated to do so because this would provide more effective results by including each individual user's search tendencies (represented by the profile) into the data mining routine as effectively as possible.

Referring to claim 16, the system and method of Bowman in view of Simoudis and Vanderveldt as applied to claim 15 above discloses the invention as claimed. See Figure 1 and the corresponding portion of Simoudis' specification for this disclosure. Simoudis' data mining library [104 & 104'], as included in the combined system includes "a cluster DMR" (Clustering 104') as claimed.

Referring to claim 17, the system and method of Bowman in view of Simoudis and Vanderveldt as applied to claim 15 above discloses the invention as claimed. See Figures 1 & 4 and the corresponding portions of Simoudis' specification for this disclosure. Simoudis' databases (114) can include any type of database having an associated database management system (DBMS), including relational databases as disclosed in the example of Figure 4. See column 4, lines 26-34; column 5, lines 59-65; and claim 3 for this disclosure.

Claim 18 is rejected on the same basis as claim 15 in light of the discussions regarding claims 1 and 5 above. See the discussions regarding claims 1, 5 and 15 for the details of this disclosure.

Claims 19 and 20 are rejected on the same basis as claims 16 and 17 respectively, in light of the basis for claim 18 above. See the discussions regarding claims 1, 5 and 15 for the details of this disclosure.

Applicant reasserts its arguments relating to claims 10-14 here, and further notes that neither Bowman nor Simoudis discloses, teaches or suggests questions derived from data mining results derived from the original query "as is" or both the original query "as is" and the related keyword expanded query. It is these constructed queries derived from the data mining process that represent the significant advancement of this invention. Nothing in Bowman, Simoudis, Vanderveldt et al. nor any combination thereof disclose, teach or suggest any such system or generating a path based

on generated sub-queries – questions, to form a query-by-question path through the data in one or more databases.

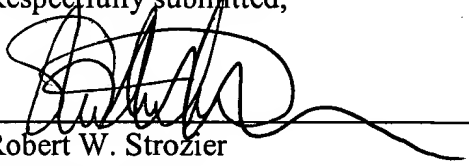
This advancement fully distinguishes the present claims over the combination of Bowman, Simoudis, Vanderveldt et al., and, therefore, Applicant respectfully requests withdrawal of this section 103(a) rejection.

Having fully responded to the Examiner's Non-Final Office Action, Applicant respectfully urges that is application be passed onto allowance.

If it would be of assistance in resolving any issues in this application, the Examiner is kindly invited to contact applicant's attorney Robert W. Strozier at 713.977.7000

Date: August 28, 2003

Respectfully submitted,


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